

PPM ViaLiteHD Quick Start Guide

This quick start guide is intended as an information summary, the relevant equipment handbook should always be treated as the master document.



Initial Inspection

Unpack and inspect the equipment as soon as possible. If there is any sign of damage or any parts missing, do not install the equipment before seeking advice from PPM or your local agent. The equipment received should match the delivery note that is shipped with the equipment. If there are any discrepancies, contact PPM or your local agent.

Electrical Safety



ViaLiteHD HPS Power Supply Units are Safety Class 1 products (having metal case directly connected to earth via the power supply cable). The unit is also fitted with an earthing/grounding stud connected to the power supply earth. When operating the equipment note the following precautions:

- Hazardous voltages exist within the equipment. There are no user serviceable parts inside; the covers should only be removed by qualified technician.
- The equipment does not have a mains isolating switch. Equipment must be installed within easy reach of a dual pole mains isolation switch.
- There are no user replaceable fuses in the rack mounted equipment. Replacement should only be carried out by a PPM technician.

ESD Precautions



Precautions for handling electro-static sensitive devices should be observed when handling all **ViaLiteHD** modules. Technicians should ensure that they use effective personal grounding (i.e. ESD wrist strap etc.) when servicing the equipment. Any equipment or tools used should be grounded to prevent static charge buildup. Good practice should be observed at all times for reference see relevant standards.

EN 61340-5-1, "Protection of Electronic Devices from Electrostatic Phenomena – General Requirements"

Optical Safety



The **ViaLiteHD** RF Transmitter modules contain laser diode sources operating at nominal wavelengths of 1270nm to 1610nm.

These devices are rated as EN60825-1:1994 CLASS 1 radiation emitting devices. A class 1 laser is safe under all conditions of normal use.

When operating the equipment note the following precautions:

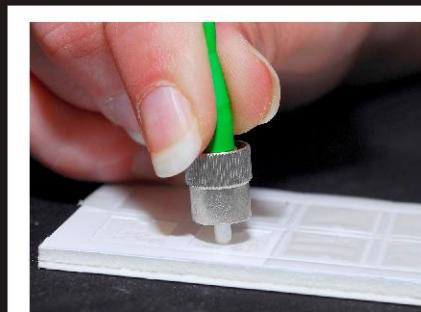
- Never look into the end of an optical fibre directly or by reflection either with the naked eye or through an optical instrument.
- Never leave equipment with radiating bare fibres – always cap the connectors.
- Do not remove equipment external covers when operating.

ViaLiteHD and ViaLite Classic compatibility

The RF and optical interfaces of **ViaLiteHD** and **ViaLite Classic** are compatible. Hence it is possible for units of different types to interwork and be used to expand existing systems. However the physical size, mounting systems and control of the units are different, so it will not be possible to mix systems in a single rack or housing. Contact PPM for more details.

Cleaning optical connectors

Optical connectors MUST be cleaned before use. **Most performance issues are due to dirty fibres.**

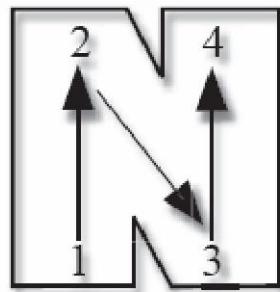


- Peel the plastic cover from an unused "N" cleaning pad.

- Hold the connector between your thumb and forefinger

Clean the connector using firm pressure by swiping in a pendulum motion through each segment of the "N" shape, following the diagram

- Do not swipe over the same space twice.

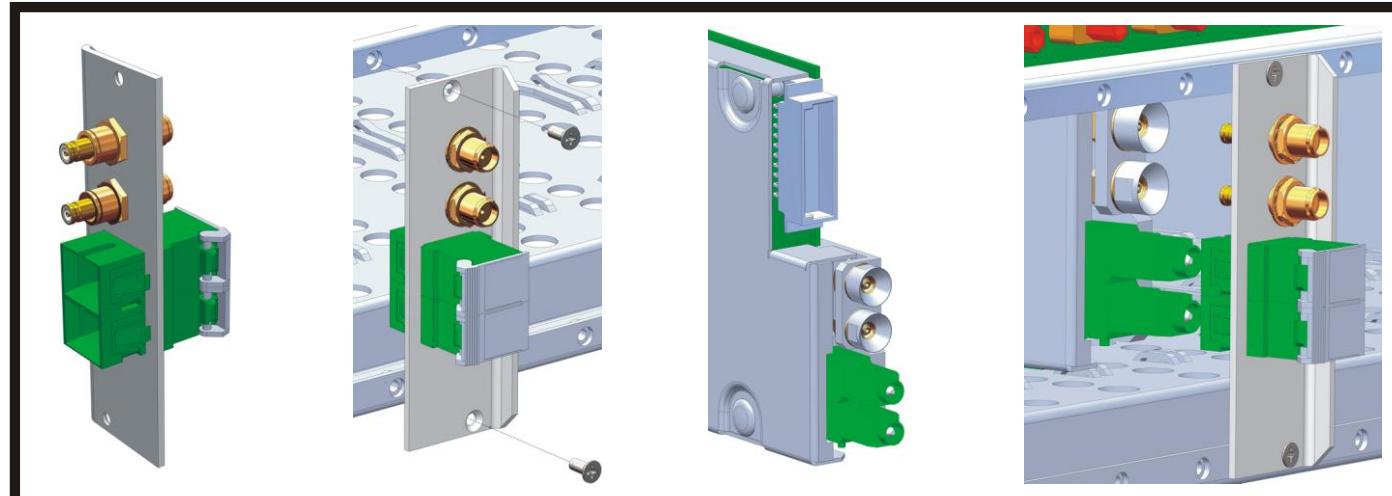


For more details please read the cleaning instruction which accompanies the connector cleaning kit. Details can also be found on the CD supplied with your equipment.

Blindmate Optical and RF Connectors

Note that the **ViaLiteHD** Blindmate system will simultaneously mate electrical, RF and optical backplane connectors, so both RF and optical connectors need to be prepared. Firstly inspect the rear Blindmating plate, ensure that the connector barrels are fitted into all RF connectors and are centrally aligned. Remove any protective covers from the optical connectors. Fit the Blindmating plate into the appropriate slot at the rear of the rack. For module installation see the following section.

Connect the external system cables to optical and RF interfaces. External interface SMA RF connectors should only be connected with a calibrated SMA torque spanner. External optical interface SC/APC adaptors are fitted with a sprung protective cover. To connect SC/APC optical connectors, remove the plug protective cover. Open the adaptor sprung cover, align the connector keyway slot in the adaptor to the key of the plug. Gently push the plug into the adapter until a click is heard and the connector locks. To disconnect, grip the body of the plug and gently pull the plug from the adaptor, replace the protective cover.



Standard Optical Connectors and Fibres

Ensure that all mating connectors are matched types.

- To connect SC/APC optical connectors, remove the connector protective cover. Align the connector keyway slot in the adaptor to the key of the plug. Gently push the plug into the adapter until a click is heard and the connector locks. To disconnect, grip the body of the plug and gently pull the plug from the adaptor, replace the protective cover.
- To connect E2000/APC optical connectors. Gently push the plug into the adapter until a click is heard and the connector locks. To disconnect, depress the lever of the plug and withdraw the connector. The protective cover engages and disengages automatically.
- To connect LC/APC optical connectors, remove the connector protective cover. Gently push the plug into the adapter until a click is heard and the connector locks. To disconnect, depress the lever of the plug and withdraw the connector, replace the protective cover.
- All PPM FC/APC equipment use narrow key FC/APC connectors, these are not compatible with wide key FC/APC. To connect FC/APC optical connectors, remove the protective cover and align the white ceramic centre ferrule on the cable connector with the mating receptacle. There is a key on the side of the ferrule, which must match the keyway slot in the receptacle shroud. When they are aligned, gently push the plug home and finger tighten the knurled collet nut onto the threaded receptacle. Disconnection is the reverse of connection; replace the protective covers on both the receptacle and the cable plug.

Minimum Bend Radius of a simplex patch cable is typically 30mm; at this radius there will be a very small increase in loss due to the bend (~0.05dB)

Connecting and Disconnecting RF Connectors

This product uses a range of RF connectors. Please ensure that RF connections are made with correctly matched connectors and cable impedances. Failure to do so may result in damage to the connectors and loss of performance. SMA RF connectors should only be connected with a calibrated SMA torque spanner. BNC connectors are available in both 50 and 75 ohms.

RF Module Input/Outputs Levels

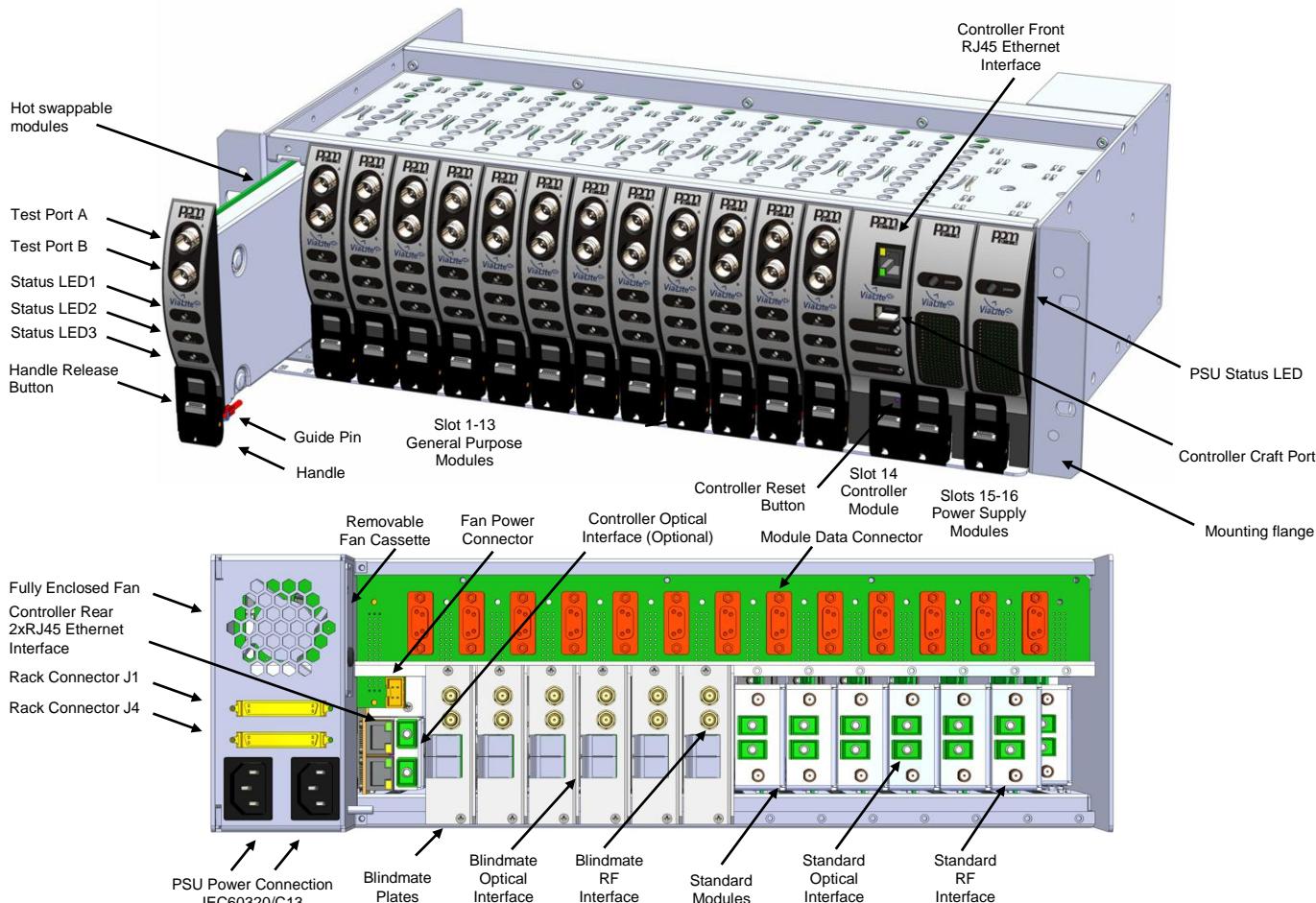
- RF inputs and outputs should not be exposed to DC voltage levels in excess of $\pm 36V$.
- Absolute maximum no damage RF input level is +13dBm (some units will tolerate more, see handbook).
- Absolute maximum no damage RF level applied to an RF output is +13dBm.

Some transmitter modules are pre-configured to have a DC voltage present on the RF input connector, to drive low noise amplifiers and similar equipment. Check module handbook and description for more details. All receiver modules will create a 1-2Vpeak DC transient from the RF output at start up into a 50Ω load (approximately 5V into a $1M\Omega$ load). This may cause failure in some very sensitive spectrum analyzers or similar equipment. All modules have AC coupled inputs and/or outputs and will be sensitive to large transients (>5V) applied to either input or output. This may result in permanent damage to the units, particularly to low frequency units. Contact PPM for more details. Some receiver modules are equipped with DC loads on their outputs, please see module handbook.

19 Inch Rack Installation

The **ViaLiteHD** 19" Rack Case is designed to fit 19" cabinets. Two options are available that occupy a height of either 1U or 3U; both have flanges for cabinet mounting. The 3U rack case provides mounting for 16 modules, 13 general purpose slots (1-13), 1 dedicated controller slot (14) and 2 dedicated power supply slots (15,16). The 1U Rack Case must be used with at least one plug-in HPS Power Supply Module, power inputs are situated at the rear of the rack with one dedicated power connection per module. The backplane contains 9-way D-type data connectors for each module position 1-13; this provides user access to module data. The rack case provides two 50 way connectors (SCSI-3 Har-mik® female) that give access to power, alarm and rack data. The mating SCSI-3 connector can be terminated with either a ribbon or individual round cable, contact PPM for more details. The pin-outs of these connectors are given in the following section. Either power supply position can be used; the power supplies are designed to current share, if more than 1 is fitted. If power supplies are operating in redundant configuration, there should be a minimum load of 20 watts to ensure that both power supplies are active, below this level one power supply may be in idle mode. A dummy load board can be supplied, to fit into any of the unused slots.

The 1U rack case provides 3 slots and 1 power supply draw. These slots can be factory configured either for 3 general purpose slots (1-3) or for 2 general purpose slots (1-2) plus 1 controller slot (3). The 1U rack case provides two 25 way standard density D connectors that give access to power, alarm, module data and rack data. The pin-outs of these connectors are given in the following section.

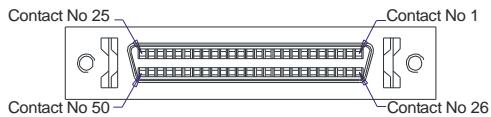
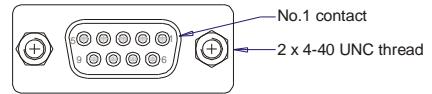


Rack Case Summary Pinout

Pin	Rack J1*	Pin	Rack J1*	Pin	Rack J1*	Pin	Rack J1*
1	GND	14	Analogue_monitor_B_8	27	ALARM_3	40	Analogue_monitor_B_11
2	ALARM_2	15	Analogue_monitor_B_10	28	ALARM_5	41	Analogue_monitor_B_13
3	ALARM_4	16	Analogue_monitor_B_12	29	ALARM_7	42	GND
4	ALARM_6	17	GND	30	ALARM_9	43	GND
5	ALARM_8	18	GND	31	ALARM_11	44	Analogue_monitor_A_2
6	ALARM_10	19	Analogue_monitor_A_1	32	ALARM_13	45	Analogue_monitor_A_4
7	ALARM_12	20	Analogue_monitor_A_3	33	GND	46	Analogue_monitor_A_6
8	ALARM_14	21	Analogue_monitor_A_5	34	ALARM_P_1	47	Analogue_monitor_A_8
9	ALARM_P_2	22	Analogue_monitor_A_7	35	Analogue_monitor_B_1	48	Analogue_monitor_A_10
10	GND	23	Analogue_monitor_A_9	36	Analogue_monitor_B_3	49	Analogue_monitor_A_12
11	Analogue_monitor_B_2	24	Analogue_monitor_A_11	37	Analogue_monitor_B_5	50	GND
12	Analogue_monitor_B_4	25	Analogue_monitor_A_13	38	Analogue_monitor_B_7		
13	Analogue_monitor_B_6	26	ALARM_1	39	Analogue_monitor_B_9		

Pin	Rack J4*	Pin	Rack J4*	Pin	Rack J4*	Pin	Rack J4*
1	CSB	14	GND	27	Relay_terminal_1	40	LNA_feed_3
2	Relay_terminal_2	15	LNA_feed_2	28	GND	41	LNA_feed_5
3	GND	16	LNA_feed_4	29	GND	42	LNA_feed_7
4	GND	17	LNA_feed_6	30	GND	43	LNA_feed_9
5	GND	18	LNA_feed_8	31	+12Vdc	44	LNA_feed_11
6	+12Vdc	19	LNA_feed_10	32	+12Vdc	45	LNA_feed_13
7	+12Vdc	20	LNA_feed_12	33	+12Vdc	46	GND
8	+12Vdc	21	GND	34	+12Vdc	47	GND
9	+12Vdc	22	GND	35	+12Vdc	48	GND
10	+12Vdc	23	GND	36	+12Vdc	49	GND
11	+12Vdc	24	GND	37	+12Vdc	50	GND
12	+12Vdc	25	GND	38	LNA_feed_1		
13	+12Vdc	26	Relay_terminal_3	39	GND		

Note: Colour indicates relevant connector drawing

* Optional custom cable available for use in **ViaLite** systemRack connector: View looking into connector
50 way SCSI-3 Har-mik® femaleModule connector: View looking into connector
9 way D-Type connector female (DE-9)

The analogue monitor functions are dependent on the type of module, see below

Function	Transmitter (single)	Receiver (single)	Transceiver	Dual Transmitter	Dual Receiver
Analogue_monitor_A	Laser bias monitor	Not Used	Laser bias monitor	Laser bias monitor A	Received light level A
Analogue_monitor_B	Not Used	Received light level	Received light level	Laser bias monitor B	Received light level B

Installation of Plug-in Modules

HPS power supply plug-in modules can be installed by pushing the release button of the module handle down and simultaneously pulling the top of the handle forwards. Align the module so that the PCB slides into the "crow's feet" with the module upright and perpendicular to the front face of the rack. Gently push the module down its guide, applying pressure via the handle and the outmost curved face (do not apply pressure to the ventilation grill). As the module is fully mated the top of the handle should snap back and lock in position. Addition resistance will be experienced as the low resistance backplane connector engages. The pawls of the handle should be fully engaged in the matching slots. To disconnect the module, push the release button of the module handle down and simultaneously pull the top of the handle forwards. Apply pressure via the handle and withdraw the module from the rack.

Blind mate modules can be installed by pushing the release button of the module handle down and simultaneously pulling the top of the handle forwards. Remove the protective cover from the modules optical connectors. Clean the module optical connector. Align the module so that the PCB slides into the "crow's feet" with the module upright and perpendicular to the front face of the rack. Gently push the module down its guide, applying pressure via the handle, as the module is fully mated the top of the handle should snap back and lock in position. The pawls of the handle should be fully engaged in the matching slots. To disconnect a module, push the release button of the module handle down and simultaneously pull the top of the handle forwards. Applying pressure via the handle and gently withdraw the module from the optical connectors.

Standard and controller modules can be installed by pushing the release button of the module handle down and simultaneously pulling the top of the handle forwards. While installing the protective covers may be left in place on RF and optical connectors. Align the module so that the PCB slides into the "crow's feet" with the module upright and perpendicular to the front face of the rack. Gently push the module down its guide, applying pressure via the handle, as the module is fully mated the top of the handle should snap back and lock in position. The pawls of the handle should be fully engaged in the matching slots. To disconnect a module, remove any cables you do not want to withdraw, push the release button of the module handle down and simultaneously pull the top of the handle forwards. Applying pressure via the handle and gently withdraw the module from the rack, replace the connector protective covers.

All **ViaLiteHD** plug-in modules are hot-swappable, so it is not necessary to power-down the rack case before inserting a module. It is advised that all unused slots be fitted with blanking panels. Different width blanking panels are available; these fit the 5HP general purpose, 6HP power supply, 7HP controller card slots. They can be used in all **ViaLiteHD** racks cases and will prevent accidental/unwanted access and the ingress of dust.

When operating RF fibre optic links the ideal operating input power is dependent on the end users system. However in all cases there will be the desire to achieve the optimal signal quality (ratio of signal to noise plus distortion). At low signal power this will be dominated by thermal noise and at high signal powers it will be dominated by distortion products. Typically a good quality signal can be obtained by operating the link at a composite input power 20dB below the fibre optic module's P1dB specification level (see handbooks).

The backplane has data connectors for module positions 1-13; this provides access to module data. The pin-outs of these connectors are given in the following section

Pin	Module	Pin	Rack Summary	Pin	Rack Summary
1	GND	4	<i>TX_232_IN</i>	7	<i>RX_422_OUT-</i>
2	<i>TX_422_IN+</i>	5	GND	8	<i>RX_232_OUT</i>
3	<i>TX_422_IN-</i>	6	<i>RX_422_OUT+</i>	9	<i>RST_485</i>

Note: Colour indicates relevant connector drawing

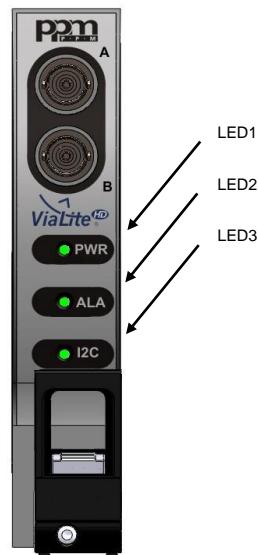
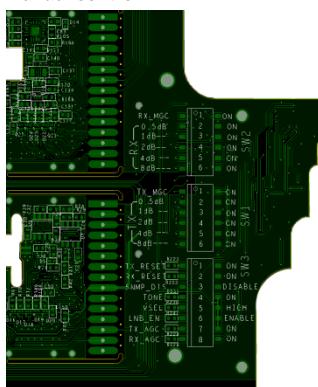
Connections in *Blue* are optional and only available on some types of module

Front Panel Indicators

The following table shows the operation of the front panel LEDs

Plug-in modules

	Colour	Plug-in Transmitter (single)	Plug-in Receiver (single)	Plug-in Transceiver	Plug-in Dual Transmitter	Plug-in Dual Receiver
Normal						
LED1	GREEN					
Flashing GREEN	Programming	Programming	Programming	Programming	Programming	Programming
RED	TX PSU fail	Not used	TX PSU fail	TXA PSU fail	RXA PSU fail	
No light	Not used	RX PSU fail	RX PSU fail	TXB PSU fail	RXB PSU fail	
LED2	GREEN					
Flashing RED fast	TX Alarm	Not used	TX Alarm	TXA Alarm	RXA Alarm	
Flashing RED slow	Not used	RX Alarm	RX Alarm	TXB Alarm	RXB Alarm	
RED	Not used	Not used	All Alarm	All Alarm	All Alarm	
LED3	GREEN		I2C enabled			
Flashing GREEN			I2C active			
AMBER			I2C disabled			

**Manual control**

The Plug-in Modules can be manually configured to set various operational parameters. The dual in line package (DIP) switches that control these configurations are located on the bottom side of the PCB and can be accessed by withdrawing the module by approximately a third of its length. One, two or three sets of switches will be installed dependent on the type of module.

To enable manual gain control the TX_MGC or RX_MGC switch must be set to ON (in some manual units the MGC may automatically be enabled). The gain can then be decreased from a maximum (all attenuators = OFF) by changing the TX or RX attenuator settings. The gain setting for the Transmitter or Receiver will depend on the sum of the attenuators set (ON= gain reduced by attenuator value, OFF = no gain reduction for that attenuator). The gain can only be changed by approximately 0.5dB steps.

Depending on configuration, some units will also allow the control of the I2C bus, VSAT power supply, LNB power, special GPS functions and automatic gain control. More details are provided in the fibre optic module handbooks.

Quick commissioning of ViaLiteHD fibre optic link

This short commissioning procedure illustrates the processes required to install and set up a communications link with gain control.

1. Install the cards in the desired location within the rack, using the installation process as described earlier in this quick start guide.
2. Remove any dust covers from your cross site fibre (or patch leads) and the connectors on the cards (if applicable).
3. Clean the cross-site cable as described within this quick start guide.
4. Insert fibre into the connectors on the rear of the rack/card ensuring that any keyway is aligned
5. Power up the equipment (both ends of the link), all cards should have 2 GREEN LEDs's and 1 AMBER LED. If any LED is RED or FLASHING RED then check fibre connections for cleanliness and that they are correctly fitted. If this does not remove the RED LED's then consult the full detailed manual (HRx-HB or HRK-HB) for the comprehensive fault finding procedure
6. Connect all RF cables to the RF connectors on the rack cards.
7. Allow the equipment to warm up for 15 minutes.
8. Ensure that the RF power into the transmitter module is set to optimum for your system. Use a broadband RF power meter for this measurement. Typically this is the input level at which the link's intermodulation distortion (IMD) is -40dBc. This value of input power is given in the datasheet for each type of **ViaLiteHD** fibre optic link.
9. Calculate the approximate optical attenuation in the fibre path. As an example, if we have two bulkhead connectors (0.2dB attenuation for each), 1500m of optical fibre (for 1310nm laser, attenuation is 0.4dB per km) giving a total of 1dB of optical loss. The total RF gain of the system should be the nominal link gain minus 2 x the optical loss.
10. For manually set gain control, adjust the gain via the SNMP GUI (where SNMP is fitted) or the dip switches on the card to the appropriate level required. For automatic gain control set up AGC as shown the full system manual (HRx-HB).
11. Confirm that the RF output from the receiver is correct (to within measurement accuracy).
12. If the loss is much higher (>3dB) than expected, the most likely explanation is dirt on the optical connectors. If this is the case, clean each connection in turn until the required system gain is restored.

ViaLiteHD user manuals

All Vialite HD user manuals are available on the CD that is shipped with each order; they can also be accessed from the www.vialite.com web site. In all cases the handbook should always be treated as the master document.